Genetics & Genomics Defined....

- **Genetics** is the study of heredity

- **Genomics** is the study of Genes and their functions
Differences between Genetics & Genomics?

- The Main Difference between Genetics and Genomics is that:
  - Genetics really examines the function and composition of a single gene where as Genomics examines all the genes and their inter-relationships in an effort to identify their combined influence on the growth and development of the organism.
Genetic Testing

- Analysis of a person’s DNA or chromosomes
- Used to detect Mutations in genes
- Can be done through a blood or saliva sample
- Used to screen for several diseases: Breast cancer BRACA 1 & 2 genes
Lynch Syndrome

- A hereditary gene mutation that can lead to higher rates of colorectal cancer.

- Also higher rates of stomach, liver, small intestine, gallbladder duct, brain and skin cancers.

- In Women with Lynch Syndrome they are genetically as higher risk for Uterine and Ovarian cancer.
Genetic Testing Registry

- A resource provided by the National Institutes of Health for people wanting to learn more about a specific genetic test.

- Goal is to advance public health and research into the genetic basis of health and disease.
World Health Organization (WHO)

- Human Genetics project
- Started in 2002
- To propel the study of genomics further in a just and ethical manner
Genetic Testing Priorities according to the WHO

• The World Health Association identified 4 priority areas for genetics and genomics:
  • 1) Genetic testing & screening.
  • 2) Genetic patents
  • 3) Genetic databanks
  • 4) Pharmacogenomics
Ethically and Socially Just Use of Genomics

• Making affordable genetic tests, screening and diagnostics
• Promote the development of new technology for vulnerable healthcare groups such as children
• More safety standards and privacy for genetic databanks, genetic testing, and screening
• Priority genetic research to lead to affordable genetic screening and products
• Promote education about genetics and genomics and build support for it in developing countries
• Sound, ethical regulation of genetic research
Genetic Testing for an Adult

• To aid in the diagnosis of a chronic illness

• To determine if a current healthy individual will develop a disease such as Alzheimer’s later in life

• To determine if the genome of an adult has certain alleles that indicate necessary lifestyle or environmental modifications such as in Diabetes

• To tailor disease and pharmacological treatment
Reflections on Genetic Testing

• It is not enough to just decide to have genetic testing but you must, in advance of the testing, decide what you will do with that information

• Will definitely guide the future of healthcare and especially disease prevention & treatment